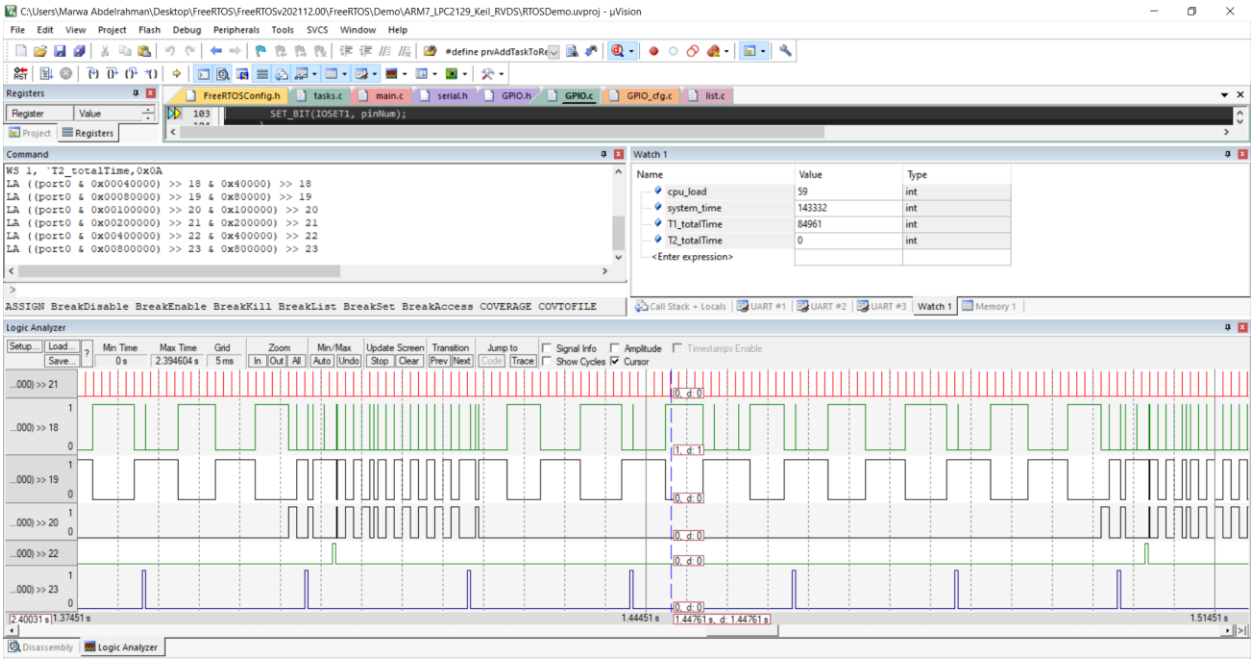
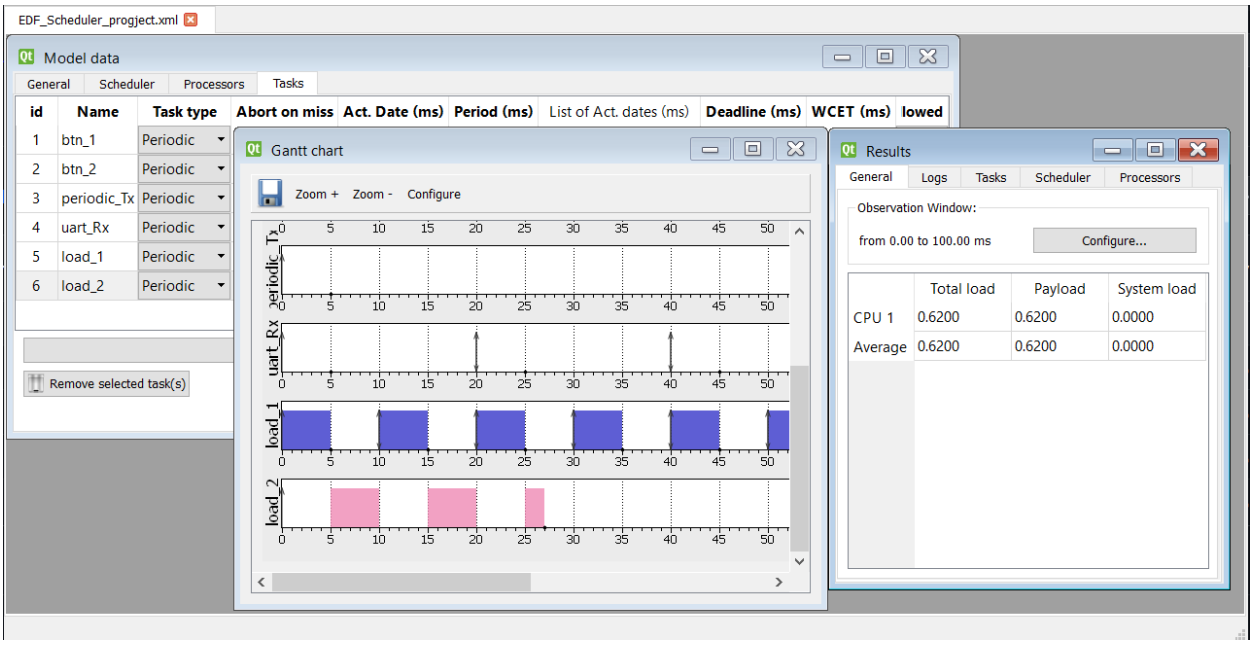
EDF Scheduler Report

From Keil simulation using Logic Analyzer we can figure out CPU load 59 % and System Time after executing tasks



Simulation using Simso indicates that load_1 task with the nearest deadline is executing first.



Comment: results are as expected as task with near deadline is executing first, and no task missed its deadline.

System Analysis:

1. CPU Load

T1 {P=10, E=5, D=10},

T2 {P=100, E=12, D=100}.

CPU Load= (5/10) + (12/100) = 0.62=62%

2. system hyper period

Two tasks having periods 10 and 100 will have a hyper period of 100,

LCM(10,100) = 100ms which means system will repeat itself after each 100ms.

Where LCM is lowest common multiple of 10 and 100.

3. Time Demand

Equation: $$w_i(t) = e_i + \sum_{k=1}^{i-1} \left\lceil \frac{t}{p_k} \right\rceil e_k \quad for\ 0 < t \le p_i$$

W = Worst response time
E = Execution time
P = Periodicity
T = Time instance

While T1 has early deadline than T2 then T1 is the highest priority.

T1 {P=10, E=5, D=10}, T2 {P=100, E=12, D=100}.

For Task1

W (1) = 5 + 0 = 5

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W (20) = 5 + 0 = 5<10

W (20) < D then T1 is schedulable.

For Task2

W (1) = 12 + (1/10) * 5 = 12.5

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W (100) = 12 + (100/10) * 5 = 62<100

W (100) < D2 then T2 is schedulable.

4. URM

$$U = \sum_{i=1}^{n} \frac{C_i}{P_i} \leq n(2^{\frac{1}{n}} - 1)$$

U = Total Utilization
C = Execution time
P = Periodicity
N = Number of tasks

T1 {P=10, E=5, D=10}, T2 {P=100, E=12, D=100}.

U= (5/10) + (12/100) = 0.62
URM = 2 * (2 ^ (1/2) -1) = 0.83
U<URM system guarantee schedulable.